PATENT APPLICATION
DOCKET NO. 10007665-1

SYSTEM AND METHOD FOR TRANSFERRING SELECTED IMAGING DATA FROM A DIGITAL CAMERA

INVENTOR(S):

Shell S. Simpson
Ward S. Foster
Kris R. Livingston

1   Inventors: Shell Simpson; Ward S. Foster; Kris R. Livingston

2   SYSTEM AND METHOD FOR TRANSFERRING SELECTED IMAGING
3   DATA FROM A DIGITAL CAMERA

4   The present invention generally relates to an improved system

5   and method for transferring selected imaging data from a digital camera to a

6   personal imaging repository.   More specifically, it relates to an improved

7   system and method for transferring selected imaging data from a digital camera

8   to a personal imaging repository, having an imaging data store for storing the

9   imaging data and a composition store for storing imaging compositions having

10   links of the imaging data serviced as a single unit, located on a computer

11   connected to a camera web server providing a camera web service via the

12   Internet.

13   To access imaging data stored on a digital camera generally

14   requires that the digital camera be connected to a personal computer ("PC")

15   having specialized software that allows the user to select images.   These

1   selected images are then stored on the user's PC hard disk. However, in order

2   for the user to use these selected images, the user must typically interact with

3   yet another software program. For example, it is currently quite popular to

4   convert the images to a Portable Document Format ("PDF") file. However, it

5   should be understood that the term "imaging data" as read herein refers digital

6   data capable of being represented as two dimensional graphics, such as a PDF

7   file or a Joint Photographic Experts Group ("JPEG") file. Currently, because

8   various programs must be used by the user to utilize the imaging data, it is

9   often necessary for the user to know exactly where these selected images were

10   stored when they were transferred from the digital camera, and it can be

11   difficult to locate the images because of the use of multiple programs.

12   BRIEF SUMMARY OF THE INVENTION

13   The present invention is directed to an improved system and

14   method for transferring selected imaging data from a digital camera to a

15   personal imaging repository. More particularly, the system and method for

16   transferring selected imaging data from a digital camera to a personal imaging

17   repository located on or operatively connected to a computer connected to a

18   web server providing a camera web service via the Internet.

19   The present invention provides a system that includes a personal

20   imaging repository associated with a particular user for storing imaging data

21   that is to be accessed by requested web services, a camera content for storing

22   selected imaging data from the digital camera onto the personal imaging

23   repository responsive to user selection, and a camera web service for providing

24   the camera content and transferring the selected imaging data from the digital

25   camera to the personal imaging repository. The personal imaging repository

2

1   acts as an exchange infrastructure between the imaging data and available web

2   services.

3   The present invention further provides a method that includes the

4   steps of requesting web content from the camera web service by the browser,

5   responding to the request by supplying camera content to the browser,

6   displaying and executing the camera content by the browser, transferring

7   selected imaging data to the camera content by the digital camera, and saving

8   the selected imaging data to the personal imaging repository.

9   DESCRIPTION OF THE DRAWINGS

10   FIGURE 1 is a preferred architectural diagram of a network

11   system in which the present invention can be implemented;

12   FIG. 2 is an architectural diagram of a second network system in

13   which the present invention can be implemented;

14   FIG. 3 is an architectural diagram of a third network system in

15   which the present invention can be implemented;

16   FIG. 4 is a flowchart illustrating the preferred functionality of the

17   transfer method of the present invention;

18   FIG. 5 is a flowchart illustrating the preferred functionality of the

19   transfer method shown in FIG. 4; and,

20   FIG. 6 illustrates an exemplary page of the camera content.

21   GLOSSARY OF TERMS AND ACRONYMS

22   The following terms and acronyms are used throughout the

23   detailed description:

24   Client-Server. A model of interaction in a distributed system in

25   which a program at one site sends a request to a program at another site and

1 waits for a response. The requesting program is called the "client," and the

2 program which responds to the request is called the "server." In the context of

3 the World Wide Web (discussed below), the client is a "Web browser" (or

4 simply "browser") which runs on the computer of a user; the program which

5 responds to browser requests by serving Web pages, or other types of Web

6 content, is commonly referred to as a "Web server."

7 Composition store. Composition store refers to a network service

8 or a storage device for storing imaging composition(s) that can be accessed by

9 the user or other web services.

10 Content. A set of executable instructions that is served by a

11 server to a client and that is intended to be executed by the client so as to

12 provide the client with certain functionality. Web content refers to content that

13 is meant to be executed by operation of a Web browser. Web content,

14 therefore, may non-exhaustively include one or more of the following: HTML

15 code, SGML code, XML code, XSL code, CSS code, Java applet, JavaScript

16 and C-"Sharp" code.

17 Exchange infrastructure. An exchange infrastructure is a

18 collection of services distributed throughout a network that stores imaging data

19 associated with a particular user through a user profile.

20 Hyperlink. A navigational link from one document to another,

21 from one portion (or component) of a document to another, or to a Web

22 resource, such as a Java applet. Typically, a hyperlink is displayed as a

23 highlighted word or phrase that can be selected by clicking on it using a mouse

24 to jump to the associated document or document portion or to retrieve a

25 particular resource.

1   Hypertext System. A computer-based informational system in
2   which documents (and possibly other types of data entities) are linked together
3   via hyperlinks to form a user-navigable "web."

4   Imaging composition. An imaging composition comprises links
5   to imaging data serviced as a single unit.

6   Imaging data. Imaging data refers to digital data capable of being
7   represented as two dimensional graphics, such as a Portable Document Format
8   ("PDF") file or a Joint Photographic Experts Group ("JPEG") file.

9   Imaging data store. Imaging data store refers to a network
10   service or a storage device for storing imaging data that can be accessed by the
11   user or other network services. The imaging data store preferably accepts the
12   imaging data in multiple standard file formats, and the imaging data is
13   converted into these file formats when necessary depending on the
14   implementation.

15   Internet. A collection of interconnected or disconnected networks
16   (public and/or private) that are linked together by a set of standard protocols
17   (such as TCP/IP and HTTP) to form a global, distributed network. (While this
18   term is intended to refer to what is now commonly known as the Internet, it is
19   also intended to encompass variations which may be made in the future,
20   including changes and additions to existing standard protocols.)

21   World Wide Web ("Web"). Used herein to refer generally to both
22   (i) a distributed collection of interlinked, user-viewable hypertext documents
23   (commonly referred to as Web documents or Web pages) that are accessible via
24   the Internet, and (ii) the client and server software components which provide
25   user access to such documents using standardized Internet protocols. Currently,
26   the primary standard protocol for allowing applications to locate and acquire
27   Web documents is HTTP, and the Web pages are encoded using HTML.

1 However, the terms "Web" and "World Wide Web" are intended to encompass

2 future markup languages and transport protocols which may be used in place of

3 (or in addition to) HTML and HTTP.

4   Web Site. A computer system that serves informational content

5 over a network using the standard protocols of the World Wide Web.

6 Typically, a Web site corresponds to a particular Internet domain name, such as

7 "HP.com," and includes the content associated with a particular organization.

8 As used herein, the term is generally intended to encompass both (i) the

9 hardware/software server components that serve the informational content over

10 the network, and (ii) the "back end" hardware/software components, including

11 any non-standard or specialized components, that interact with the server

12 components to perform services for Web site users. Importantly, a Web Site

13 can have additional functionality, for example, a Web site may have the ability

14 to print documents, scan documents, etc.

15   HTML (HyperText Markup Language). A standard coding

16 convention and set of codes for attaching presentation and linking attributes to

17 informational content within documents. (HTML 2.0 is currently the primary

18 standard used for generating Web documents.) During a document authoring

19 stage, the HTML codes (referred to as "tags") are embedded within the

20 informational content of the document. When the Web document (or HTML

21 document) is subsequently transferred from a Web server to a browser, the

22 codes are interpreted by the browser and used to display the document.

23 Additionally in specifying how the Web browser is to display the document,

24 HTML tags can be used to create links to other Web documents (commonly

25 referred to as "hyperlinks"). For more information on HTML, see Ian S.

26 Graham, The HTML Source Book, John Wiley and Sons, Inc., 1995 (ISBN

27 0471-11894-4).

1   HTTP (HyperText Transport Protocol). The standard World
2   Wide Web client-server protocol used for the exchange of information (such as
3   HTML documents, and client requests for such documents) between a browser
4   and a Web server. HTTP includes a number of different types of messages
5   which can be sent from the client to the server to request different types of
6   server actions. For example, a "GET" message, which has the format GET
7   <URL>, causes the server to return the document or file located at the specified
8   URL.

9   URL (Uniform Resource Locator). A unique address which fully
10 specifies the location of a file or other resource on the Internet or a network.
11 The general format of a URL is protocol: //machine address:port/path/filename.

12   User Information. User information is identification and security
13 information used in accessing imaging composition(s) and imaging data
14 associated with a particular user profile. It is preferably accessed either
15 directly or indirectly through methods provided by an extension component
16 integrated into the web browser.

17   PDA (Personal Digital Assistant). A small hand-held computer
18 used to write notes, track appointments, email and web browser with generally
19 with far less storage capacity than a desktop computer.

20   Personal imaging repository. A personal imaging repository is a
21 conceptual term describing the exchange infrastructure used to exchange
22 imaging composition and imaging data with web services. Users are associated
23 with their imaging data through user profiles.

24   DETAILED DESCRIPTION

25   Broadly stated, the present invention is directed to an improved
26 system and method for transferring selected imaging data from a digital camera

1   to a personal imaging repository. The system and method provide for the

2   transferring of imaging data to a personal imaging repository that is associated

3   with the user. In addition, the personal imaging repository acts as an exchange

4   infrastructure for any available web services. As a result, users can utilize

5   images from a digital camera more readily and easily.

6   The preferred network system in which the present invention can

7   be implemented is shown in FIG. 1 and indicated generally at 10. An imaging

8   client computer 12 is connected to a camera web server computer 14 via an

9   Internet connection 16. The camera web server computer 14 provides a camera

10   web service 18 linked to a digital camera 20 for displaying imaging data stored

11   in the camera. The imaging client computer 12 can access the camera web

12   service 18 through a browser 22. When the browser 22 browses to the web

13   service 18, the camera web server 14 responds with a camera content 24 for

14   selectively storing the imaging data onto a personal imaging repository 26 (an

15   example page of the camera content is shown in FIG. 5). The camera content

16   24 is then executed by the browser 22.

17   The browser 22 also includes an extension component 30, which

18   provides access to user information 32 that associates the camera content 24

19   with the personal imaging repository 26 that belongs to this user. Although it

20   is shown and preferred that the extension component for accessing user

21   information located on the browser of the imaging client computer, the user

22   information can also be implemented in other places in the network system. In

23   fact, other ways to implement access to the user information can be used. For

24   example, signed content can be used with digital signature security

25   technologies. There are unlimited number of ways to implementing the

26   security system in accessing the user information and the personal imaging

1   repository. However, these other implementation are contemplated and within

2   the scope of the present invention.

3   In the present invention, it is preferred that the personal imaging

4   repository 26 includes a composition store 34 for storing imaging

5   composition(s) of the imaging data that are serviced as a single unit and an

6   imaging data store 36, i.e., digital memory, for storing the imaging data. An

7   imaging composition preferably comprises links to the imaging data, which can

8   be located at another web service's site. As a result, the composition store 34

9   stores only the imaging compositions. The imaging data store 36, on the other

10   hand, is any imaging data store located on any computer that contains the

11   imaging data. More specifically, each web service can have its own imaging

12   data store 36 available to the public.

13   For example, at some earlier time, a user may print an article

14   from a web service site, resulting in an imaging composition being created and

15   stored in the user's composition store. The imaging composition contains only

16   the link to the imaging data for this article stored on the web service site.

17   Consequently, the imaging data for the article is not located in the imaging data

18   store that is stored on the imaging client 12. Rather, the imaging data is stored

19   in the imaging data store on the web service site. Of course, users will have an

20   imaging data store that belongs to their user identification where they can store

21   imaging data, which is the imaging data store shown in the imaging client. As

22   a result, the term "personal imaging repository" 26 is meant as a conceptual

23   term for an exchange infrastructure between the imaging data and the available

24   web services. Similarly, the term "web" denotes millions of distinct servers

25   that comprise the web. However, the web does not actually do anything itself.

26   Similarly, the servers serving the composition store and the imaging data store

27   are physical implementations of the personal imaging repository as a concept.

1   In this preferred implementation, whenever a user requests that

2   selected imaging data is to be transferred from a digital camera, the imaging

3   data will be automatically stored in the personal imaging repository 26 that is

4   associated with this user. In other words, users will no longer be asked to

5   indicate a place where the imaging data should be copied to. Rather, the

6   imaging data will automatically be downloaded to the user's personal imaging

7   repository 26. From the personal imaging repository 26, other web services are

8   configured to look into the personal imaging repository 26 to access particular

9   imaging data that have been requested for servicing.

10   As a result, the personal imaging repository 26 becomes the

11   exchange infrastructure for the imaging data for the web services. In other

12   words, the personal imaging repository 26 acts as an exchange infrastructure

13   for the imaging data for these available web services. The user no longer has to

14   remember in which directory they placed the selected imaging data. When the

15   user requests web services for any of the imaging data stored in the personal

16   imaging repository, the requested web service is configured to access the active

17   imaging data stored in the personal imaging repository. Furthermore, the user

18   will no longer be asked where to store these selected imaging data, because

19   they are automatically stored in the personal imaging repository when the user

20   uses the camera web service for transferring imaging data from a digital

21   camera. In fact, since the camera web service is web-based, it is unnecessary

22   for the user to download and install software for transferring data from the

23   digital camera.

24   It should be noted that the personal imaging repository 26 can

25   represent any type of data storage device. In fact, the data storage device 26

26   does not necessarily have to be located within the imaging client computer 12.

27   The personal imaging repository 26 can be located, for example, on another

10

1 storage medium, which the client machine can access through alternative

2 communication links. Although it is currently preferred to include the personal

3 imaging repository 26 with the imaging client, this would likely change as the

4 bandwidth becomes faster and the popularity of the personal digital assistant

5 ("PDA") increases. These alternative implementations are contemplated, and

6 should be considered to be within the scope of the present invention. One

7 preferred embodiment that is more tailored to faster bandwidth or any client

8 machine with limited storage capacity is shown in FIG. 2.

9   A second network system is shown in FIG. 2, and indicated

10 generally at 40. In this implementation, multiple users can utilize the same

11 imaging client computer 42 that is connected to a camera web server 44

12 through the Internet 46. In this implementation, the imaging client computer

13 42 can include client computers that have less storage memory, such as a

14 Personal Digital Assistant ("PDA") or a laptop. Because of the limit on the

15 storage memory, the personal imaging repository 48 for storing user's imaging

16 data is located on a data storage device 50 that, although linked to the imaging

17 client computer, is separated physically from the imaging client computer 42,

18 which can also be a server computer or a linked client machine.

19   Similarly, the camera web server 44 provides a web service 52

20 representing a linked digital camera 54 for transferring the imaging data.

21 Using a browser 56 located on the imaging client computer 42, the user

22 browses to the web service 52, which responds by displaying a camera content

23 58. The browser 56 then executes the camera content 58. The browser 56

24 further includes an extension component 62 providing access to user

25 information 64 that can associate the camera content 58 to the personal imaging

26 repository 48 assigned to this user. The personal imaging repository, in this

1   second embodiment, similarly includes a composition store 66 for storing

2   imaging compositions and an imaging data store 68 for storing imaging data.

3   In this implementation, users can access the system 40 and their

4   personal imaging repository 48 from any imaging client computers that have a

5   browser 56 having their user information 64 and Internet access. As a result of

6   the flexibility of the Internet, it is possible for users to access the system 44 and

7   their personal imaging repository 48 using a standard PDA and/or a wireless

8   web phone. This embodiment provides a more flexible access to the personal

9   imaging repository 48, which may be more desirable as technology improves.

10   Finally, a third embodiment of the system in which the present

11   invention can be implemented is shown in FIG. 3 and indicated generally at 70.

12   In this embodiment, since the camera web server 72 is located in the digital

13   camera 74, unlike the previous embodiments, it is unnecessary for the digital

14   camera to establish a link to the camera web server. As shown, the imaging

15   data 76 from the digital camera 74 are already linked to the web server 72

16   without additional connections. An imaging client 78 with a browser 80 that

17   connects to the camera web server 72, which is located in the digital camera 74,

18   over the Internet 82.

19   Similarly, the camera web server 72 sends a camera content 84

20   that allows the user to select imaging data from the digital camera for transfer

21   responsive to the user browsing to the camera web service 86. The camera

22   content 84, in turn, is executed by the browser 80, which includes an extension

23   component 90 with user information 92 that links the camera content 84 to the

24   personal imaging repository 94. Although it is shown that the personal

25   imaging repository 94 is located in the imaging client computer 78, it is also

26   within the scope of the present invention that the personal imaging repository

27   be located on a data storage device that is physically located outside of the

12

1   imaging client computer as well. A composition store 96 and an imaging data

2   store 98 are similarly found in the personal imaging repository 94. Imaging

3   compositions are stored in the composition store 96, while the imaging data are

4   stored in the imaging data store 98.

5   It should be noted that there are unlimited number of ways to

6   implement the topology of the network system. For example, although not

7   shown, the camera web service can also reside on the imaging client 12, instead

8   of being on a separate camera web server. These various implementations are

9   contemplated and should be considered to be within the scope of the present

10   invention.

11   Turning to an important aspect of the present invention, a flow

12   chart of the preferred functionality of the transfer method is shown in FIGS. 4

13   and 5, and indicated generally at 100. The browser first requests a web content

14   from the camera web service for the selection of imaging data stored on a

15   linked digital camera (block 102). It is then determined whether the imaging

16   client computer has established a successful connection with the camera web

17   service (block 104). If a connection has not been established (block 104), the

18   imaging client computer returns an error message to the user (block 106),

19   which then ends the process. Otherwise, the camera web service determines

20   whether a digital camera is connected to it (block 108), and again an error

21   message will be returned to the user (block 110) if the connection to a digital

22   camera cannot be found.

23   Once a connection to a digital camera is established (block 108),

24   the camera web service responds to the request by supplying camera content to

25   the browser (block 112), which the browser displays and executes the camera

26   content (block 114). After execution of the camera content (block 114), the

27   camera content next retrieves the imaging data stored on the digital camera

13

1 (block 116). The retrieved imaging data is displayed to the user on the browser

2 for selection (block 118), and an exemplary page of the camera content is

3 displayed. The user selects the desired imaging data to be transferred to the

4 personal imaging repository (block 120) by interacting with the camera

5 content, which prompts the camera content to request the selected imaging data

6 from the camera web service (block 122).

7 After the camera web service receives the request from the

8 camera content (block 124) (shown in FIG. 5), the camera web service requests

9 the selected imaging data from the digital camera (block 126). The digital

10 camera receives the request from the camera web service for the selected

11 imaging data (block 128), and accordingly transfers the selected imaging data

12 to the camera web service (block 130). After receiving the transferred selected

13 imaging data from the digital camera (block 130), the camera web service, in

14 turn, transfers the imaging data to the camera content (block 132). The camera

15 content receives the selected imaging data from the camera web service (block

16 134).

17 Consequently, the camera web content, executed and displayed

18 on the browser of the imaging client, saves the transferred selected imaging

19 data to the imaging data store (block 136), and creates an imaging composition

20 including a link for each selected imaging data (block 138). The camera web

21 content accordingly saves the imaging composition in the composition store

22 (block 140), and the imaging composition is set as a selected imaging

23 composition (block 142). Because the imaging composition is set as the

24 selected composition, it will be used by web services that make use of the

25 selected composition of the personal imaging repository.

26 An exemplary page of the camera content is shown in FIG. 6.

27 The camera content shows a total of six images that can be transferred from the

1   digital camera. In this example, image 3 and image 4 are selected and ready to

2   be transferred. Optional image features may be included, such as having the

3   image fill the whole page. Once the user has selected the desired images, the

4   user can then press the retrieve button on the camera content to initiate the

5   transfer process. Only the selected images (e.g., image 3 and image 4) are

6   uploaded to the personal imaging repository that is associated with this user's

7   information, which is found through the extension component. The user need

8   not know where exactly these images are stored, because the user can use these

9   images at a later time by simply browsing another web page that is set up to list

10   all the imaging data stored on the personal imaging repository.

11   From the foregoing description, it should be understood that an

12   improved system and method for selectively transferring imaging data from a

13   digital camera to a personal imaging repository has been shown and described,

14   which has many desirable attributes and advantages. The system and method

15   provides for the transferring imaging data from a digital camera to a personal

16   imaging repository that can be easily selected by the user using a browser.

17   Furthermore, because the personal imaging repository is set up as an exchange

18   infrastructure between the imaging data and web services, users no longer need

19   to recall where their previous transferred images are located on their hard disk.

20   The present invention allows the user to selectively transfer imaging data from

21   a digital camera that allows for greater flexibility for the user. In addition, the

22   user can manage their imaging data more easily with fewer limitations.

23   While various embodiments of the present invention have been

24   shown and described, it should be understood that other modifications,

25   substitutions and alternatives are apparent to one of ordinary skill in the art.

26   Such modifications, substitutions and alternatives can be made without

1 departing from the spirit and scope of the invention, which should be

2 determined from the appended claims.

3   Various features of the invention are set forth in the appended

4 claims.